Colorado Lagoon Restoration Feasibility Study

Work Program

1.0 Introduction

1.1 Background

Colorado Lagoon is a 15-acre, V-shaped tidal lagoon in the City of Long Beach and is connected to Alamitos Bay and the Pacific Ocean through a tidal box culvert to Marine Stadium. Recreation Park borders the north side of the lagoon, which includes a nine-hole and eighteen-hole golf course, a baseball and softball field, casting pond, picnic area, dog park, lawn bowling and playground. Residences and public schools surround the other three sides of the lagoon. A preschool program for three- to five-year-olds is located near the beach of the lagoon, and children ages seven years and older participate in a model sailboat club during the summer. Swimming, fishing, wildlife viewing, and picnicking are popular recreational activities.

Colorado Lagoon was once part of the historic Alamitos Bay, which also included the Los Cerritos Wetlands. In 1923, the Channel Club dredged a mudflat to form Colorado Lagoon. The 1932 Los Angeles Olympic Committee chose the lagoon for rowing events. In 1968, the City of Long Beach remodeled Marine Stadium for the Olympic Rowing and Canoeing Team Trials. At that time, the north end of the Olympic course was filled as part of construction for the then-proposed Pacific Coast Freeway, thereby further separating Colorado Lagoon from Marine Stadium and extending the existing connecting culvert. The ecological health of the lagoon has been deteriorating for many decades. People have always swum and fished in the lagoon, but there has always been concern about the poor water quality. In 1999, a group of residents formed the Friends of Colorado Lagoon (FOCL) specifically to advocate for improving the lagoon.

In January 2001, FOCL and the City both submitted proposals to the Southern California Wetlands Recovery Project (WRP) for funding for a feasibility study for the lagoon. Both proposals described the need for a study of the lagoon that would address the lagoon's poor water quality and declining habitat value. In June 2001, the WRP Board of Governors added the project to the work plan. In December 2002, the State Coastal Conservancy awarded a grant to the City for preparation of a habitat restoration feasibility study.

Since the lagoon is a natural low point in the watershed, it accumulates pollutants deposited over the entire watershed that are washed into the storm drains by storm flows and dry weather runoff. In addition to tidal influence, the lagoon receives the majority of its inflow from five reinforced concrete pipes draining storm water and dry weather runoff from the watershed.

According to the Long Beach Storm Water Management Plan, Colorado Lagoon's watershed is 1,172 acres comprised primarily of suburban residential development with some parklands, two golf courses and a small amount of commercial and institutional land use. Urban runoff

generally contains many pollutants such as heavy metals, pesticides, petroleum hydrocarbons, nutrients, and bacteria. In fact, the lagoon is listed in the 2002 California Section 303(d) list of the Clean Water Act as an impaired water body for lead, zinc, sediment toxicity, chlordane, DDT, dieldrin, PAHs, and PCBs. Beach advisory postings due to elevated bacteria are frequently posted. In the estuarine environment of the lagoon, many pollutants readily precipitate out of the water column and settle in the sediment on the lagoon floor.

For many years, the City of Long Beach and County of Los Angeles have been laying the groundwork to address flooding and water quality issues in the Colorado Lagoon watershed. Los Angeles County Department of Public Works is preparing an environmental impact report to replace an existing County storm drain that drains into Colorado Lagoon. The storm drain, referred to as the Termino Drain, is being replaced in order to alleviate flooding that occurs upstream and at the lagoon. This project may include a dry weather diversion to the sanitary sewer and a low-flow bypass to Marine Stadium. In addition, the State Water Resources Control Board has approved a grant to the City through the Clean Beaches Initiative of the Costa-Machado Water Act of 2000 (Proposition 13) to plan and construct diversions of dry weather runoff from the City storm drains (that also drain into Colorado Lagoon) to the Los Angeles Bureau of Sanitation's wastewater treatment plant. The City also plans to use a portion of a state appropriation to fund the installation of pollution traps in the City's storm drains, which drain into Colorado Lagoon. The grant will be used for several projects in the City, but a portion of the funds will be for Colorado Lagoon.

While these projects address immediate problems and will go a long way toward reducing water quality problems, additional solutions to pollution, habitat restoration, and recreational improvements are needed. A feasibility study funded by the Conservancy will help the City of Long Beach integrate and improve the multiple uses of Colorado Lagoon such as habitat, recreation, and storm water management.

1.2 Purpose

The purpose of the Colorado Lagoon Restoration Feasibility Study is to evaluate and recommend feasible opportunities to restore the marine ecosystem and support safe recreation while improving water and sediment quality and managing storm water in Colorado Lagoon.

1.3 Objectives

- Redirect, reduce, or treat storm and dry weather runoff to minimize contamination of water and sediment in Colorado Lagoon.
- Identify sources of pollutants and recommend controls within the watershed.
- Evaluate the need to remove contaminated sediments.
- Restore and maintain estuarine habitat.

- Improve Colorado Lagoon's circulation and the tidal connection with Marine Stadium and Alamitos Bay.

- Balance flood control, recreation, and pollution abatement at Colorado Lagoon.

2.0 Summary of Issues

The issues listed below will be addressed in the feasibility study. It is expected that additional issues will be developed during the information-gathering portion of the study, and those issues will be addressed in the consultant's analysis and recommendations.

2.1 Existing Habitats and Species

Colorado Lagoon supports an estuarine ecosystem. Southern tar plant, a special status species, and eelgrass colonies exist in shallow areas of the lagoon and Marine Stadium. A variety of fish species find spawning and rearing habitat such as juvenile halibut, topsmelt, perch, white sea bass, bottom dwelling gobies and stingrays. Additionally, juvenile clams have been found in the lagoon. The California brown pelican and California least tern, special status species, as well as many other species of waterfowl, gulls, and shorebirds visit and dwell in the tidal habitats. Habitat restoration goals must be established. Potential direct and indirect impacts to existing habitats and the protected species that they support must be evaluated.

2.2 Hydrology and Hydraulics

Enhancement of hydrologic conditions within Colorado Lagoon is a priority. Specifically, improving lagoon circulation and the tidal connection with Marine Stadium and Alamitos Bay should be evaluated. Flood control within the Colorado Lagoon area is also a concern. Considerations of engineering and economic feasibility for various improvements will be factors in identifying potential alternatives.

2.3 Sediment Evaluation

A sediment sampling plan is a key component of the planning process since contaminated sediments may be present. Mitigation of sediment conditions may be in order. The need to remove contaminated sediments should be evaluated.

2.4 Sea Level Rise

The effects of sea level rise must be assessed and included in criteria for the feasibility study.

2.5 Legal and Political Factors

The feasibility study should evaluate legislation, regulatory mandates, permitting requirements, MOUs, and other special agreements that may constrain or enhance restoration opportunities.

2.6 Public Access

Colorado Lagoon is a recreational area where swimming, model boating, and picnicking take place. Public access should be balanced with the other aspects of the project. Long Beach's Local Coastal Program (LCP) calls for examination of the land distribution between Colorado Lagoon and the adjacent City-owned golf course to ensure that any improvements diversify the uses of Colorado Lagoon and provide opportunity for residents with a variety of interests to utilize and enjoy the Lagoon.

2.7 Community Impacts and Benefits

The study should evaluate how any improvements will impact properties within the watershed.

2.8 Community Outreach

There is a great deal of community interest in the future of Colorado Lagoon. The planning process must include ample opportunity for public input from the beginning of the process. In addition, project information should be made easily accessible to the public.

3.0 Scope of Work

3.1 Establish Project Goals and Objectives

Convene a joint meeting of the Technical Advisory Committee (TAC), community stakeholders, and the citywide, Council-appointed Colorado Lagoon Advisory Group (CLAG) to obtain input that represents the views of all the stakeholders. Work with the Stormwater Management staff to ensure all perspectives are acknowledged in the feasibility study. Review existing sources of information and establish a list of jointly recommended goals for the study and the specific objectives for this phase of the planning.[1]

Deliverable:

- List of jointly recommended goals and objectives

3.2 Water Quality Assessment

Collect data for the project area from existing sources and establish a resource library of existing reports, data, and general information. Conduct an initial environmental study through field observations and sampling to identify the full range of pollutants of concern (e.g., metals, pesticides, bacteria). Prepare an environmental site assessment indicating the presence, types, and concentrations of soil and water contaminants. Examine the connection between Colorado Lagoon and Marine Stadium for possible improvements to water quality. Evaluate the data to identify sources of pollutants (e.g., irrigation runoff, sewer leaks).

[1] Meetings of the CLAG and joint meetings of the CLAG and TAC shall be noticed public meetings conduct in full compliance with the Brown Act. While the City will provide assistance, the consultant is responsible for scheduling and conducting meetings, maintaining a mailing or email list of interested parties and providing written notice of meetings.

Develop preliminary remediation options for the various restoration alternatives. Recommend source controls and remedies and evaluate diverting storm drain flows to the ocean or San Gabriel River as suggested in the LCP.

All sampling should be in accordance with the latest edition of "Standard Methods for the Examination of Water and Wastewater" (American Public Health) including the use of appropriate non-contaminating sampling apparatus and sampling holding glassware compatible with the chemical analyses to be performed. All analyses should be conducted in a laboratory certified for such analyses by the State Department of Health Services. Analytical techniques should follow those listed in 40 Code of Federal Regulations (CFR) Part 136. All testing is the Consultant's responsibility and is included in the project's budget.

Deliverable:

- Water Quality Assessment Report

3.3 Sediment Quality Assessment and Options for Sediment Disposal

Take samples of sediment to evaluate if contamination is present, and if so, at what levels. Identify sources of contamination (e.g., naturally-occurring by organisms in sediment) and recommend source controls and remedies. Assess option of dredging to eliminate existing contaminated sediment. Evaluate potential disposal options for dredged/excavated material associated with earthwork activities. Offshore, nearshore, beach, and onsite placement of dredged/excavated sediment should be evaluated as disposal options. Prepare order-of-magnitude cost estimates, disposal capacities, and potential permit requirements for each disposal option. All testing is the Consultant's responsibility and is included in the project's budget.

Deliverable:

- Sediment Sampling and Dredge Disposal Report

3.4 Characterize Hydrologic and Hydraulic Conditions

Evaluate the hydrologic water balance of the lagoon, including an assessment of inputs and outputs from tidal input, stormwater runoff from the storm drain system and storm events, dry season low flows, released/treated water, and groundwater. Characterize hydraulic flow patterns into, out of and within the lagoon. Flood control within the Colorado Lagoon area is high priority. Engineering and economic feasibility for various improvements must be considered in identifying potential alternatives. A hydrologic model shall be created for this task that is detailed enough to support the feasibility analysis and assess proposed project alternatives described in Task 3.9.

Deliverable:

- Written hydrological report and model as described in Section 3.4

3.5 Characterize Tributary Watershed Activities Impacting the Lagoon

Evaluate upstream conditions and activities (e.g., point and non-point source pollution, land use practices) that impact the Colorado Lagoon restoration potential and long-term, sustainable success.

Deliverable:

- Watershed Impacts Report

3.6 Water Quantity Assessment

Assess the flood risk in the vicinity of Colorado Lagoon as it is now and with the potential improvements to inputs and circulation. Investigate opportunities in the watershed to create vegetated swales, detention areas, and/or wetlands to decrease the peak flows and spread out the storm flows reaching Colorado Lagoon.

Deliverable:

- Basin Hydrograph

3.7 Habitat Assessment

Develop a habitat assessment for the study area using existing data and supplemented where necessary with additional surveys. The habitat assessment should include sensitive species considerations and evaluation of existing habitat and land management practices. Examine the connection between Colorado Lagoon and Marine Stadium for possible restoration to the estuarine ecosystem.

Deliverable:

- Habitat Assessment
- Special Status Species Considerations Report

3.8 Develop Opportunities and Constraints to Habitat Restoration

Integrate results from previous tasks to develop a systematic overview of the project area and determine the opportunities and constraints for habitat restoration. Identify preliminary restoration alternatives based on the opportunities and constraints. Present and discuss findings with the TAC, CLAG, and community stakeholders and incorporate comments into the report.

Deliverable:

- Opportunities and Constraints Report (including description of preliminary restoration alternatives)

3.9 Develop and Evaluate Restoration Alternatives

Refine descriptions of restoration alternatives and prepare an analysis of each alternative. Restoration alternatives should identify separate projects that can be implemented as stand-alone efforts. For each alternative, the analysis should include

- **Description.** Describe each alternative, including major infrastructure changes, hydrologic regime, environmental benefits and impacts, flood control impacts, and resulting changes in habitat quantity and quality. Each description should include a table summarizing pre- and post-project habitat types.

- **Hydrodynamic modeling.** Conduct hydrodynamic modeling to estimate the size of drains and culverts required to achieve the desired hydrologic conditions within the restored area.

- **Preliminary designs.** Prepare conceptual grading plans, typical cross-sections, and habitat elevation bands.

- **Maintenance.** Evaluate long-term maintenance needs. Maintenance items to be investigated include culverts, water quality swales, tide gate operation, and flood impact mitigation to the restored area.

- **Preliminary environmental review.** Conduct a CEQA initial study for each alternative to identify potentially significant impacts and possible options for mitigating them.

- **Estimated costs.** Costs should include estimates for remediation, design, engineering, environmental review, permitting, construction, and long-term management and monitoring.

Deliverable:

- Written report that fully describes and analyzes each alternative for each of the concerns addressed in the preceding bullets

3.10 Finalize Restoration Alternatives

Convene a meeting of the CLAG and community stakeholders to get input on the restoration alternatives that have already been deemed feasible by the TAC. Summarize comments from meetings for the TAC. Convene a meeting of the TAC to obtain final comments to be incorporated into the final report.[2]

Deliverable:

- Comments from the CLAG and community stakeholder meetings

- List of preferred alternatives

[2] Meetings of the CLAG and joint meetings of the CLAG and TAC shall be noticed public meetings conduct in full compliance with the Brown Act. While the City will provide assistance, the consultant is responsible for scheduling and conducting meetings, maintaining a mailing or email list of interested parties and providing written notice of meetings.

3.11 Prepare Conceptual Restoration Plan (final report)

The final report will document the hydrologic, biologic, land use, and other information gathered as part of this study and provide a basis for understanding the various alternatives considered. The report will also 1) compare and rank alternatives for achieving program goals, including natural resource enhancement, storm water management, recreation, and water quality restoration; and 2) compare and rank alternatives for cost including final design, environmental review, permitting, construction, beneficial use of excavated materials, and short- and long-term maintenance and management. Finally, the report should present a preferred set of alternatives.

Deliverable:

- Colorado Lagoon Restoration Feasibility Report

3.12 Prepare Scope of Work for Next Phase of Restoration Planning

In consultation with the TAC, prepare a detailed scope of work for the next phase of restoration planning. Identify outstanding issues that need to be addressed before detailed planning occurs.

Deliverable:

- Scope of work for next phase of restoration planning

3.13 Public Involvement

Workshops to solicit community input should be held at key milestones within the planning process including at the commencement of the planning effort, when preliminary alternatives have been identified, and before adopting a list of restoration alternatives. The consultant should propose a schedule for any additional community meetings in order to best meet the project goals.

3.14 Reporting

In addition to the Deliverables listed in each section, the consultant shall submit a letter no later than the 21st of each month to the City of Long Beach Department of Public Works reporting on the work accomplished for the prior month, the status of items in progress, and projected accomplishments for the following month.

4.0 Agency and Stakeholder Participation

4.1 Technical Advisory Committee

Following is a preliminary list of members of the TAC:

- Restoration Ecologist
- Landscape Architect
- Water Quality Specialist
- Civil/Environmental Engineer with storm water management or hydrology expertise

- Laboratory Analyst

The following agencies will be invited to designate a representative to the TAC:

- California Coastal Commission (CCC)
- California Department of Fish and Game (DFG)
- Rivers and Mountains Conservancy (RMC)
- Los Angeles Regional Water Quality Control Board (LARWQCB)
- U.S. Fish and Wildlife Service (FWS)
- U.S. Army Corps of Engineers (ACOE)
- National Marine Fisheries Service (NMFS)
- County of Los Angeles
- City of Long Beach
- State Coastal Conservancy (SCC)

4.2 Other Stakeholders

In order to obtain citywide input to this regional asset, each Councilmember will have the opportunity to appoint residents to a citizens advisory group to be created by the City Council. This group, identified as the Colorado Lagoon Advisory Group (CLAG), will also participate in the planning process.